# TMDLs for Chlorides, Sulfates, Total Dissolved Solids (TDS), Sediment, Total Suspended Solids (TSS) and Turbidity for Selected Subsegments in the Terrebonne River Basin, Louisiana (120101, 120102, 120104, 120105, 120106, 120110, 120111, 120112, 120201)

## Fact Sheet

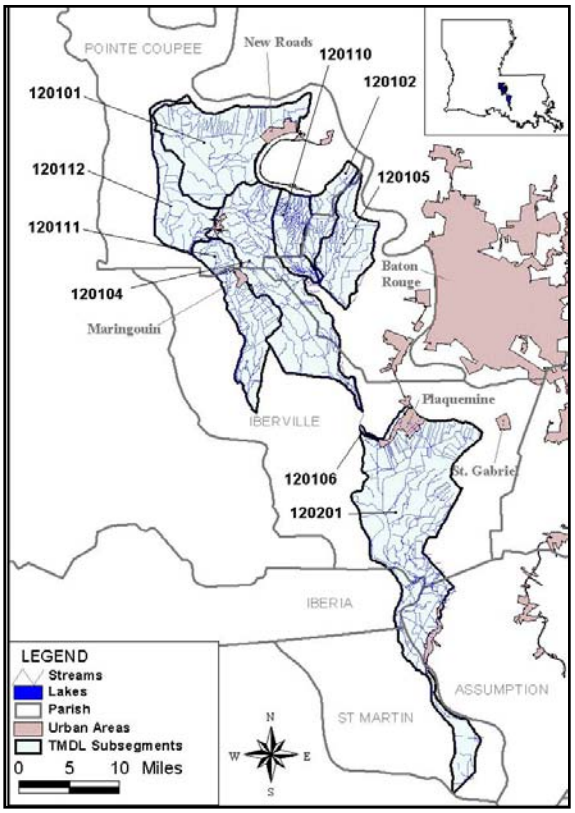


**Figure 1. Location of the impaired subsegments in the Terrebonne River Basin**

Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency's Water Quality Planning and Management Regulations require states to develop Total Maximum Daily Loads (TMDLs) for waterbodies that are not meeting water quality standards. A TMDL establishes the amount of a pollutant that a waterbody can assimilate without exceeding its water quality standard for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and nonpoint sources to restore and maintain the quality of the state's water resources.

A TMDL for a given pollutant and waterbody is composed of the sum of individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background levels. In addition, the TMDL must include an implicit or explicit margin of safety (MOS) to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody and may include a future growth (FG) component.

This fact sheet presents a summary of the TMDLs that have been developed for chlorides, sulfates, TDS, sediment, TSS and turbidity for nine subsegments in the Terrebonne River Basin in southeastern Louisiana (Figure 1).

Louisiana Department of Environmental Quality (LDEQ) included the nine subsegments in the Terrebonne River Basin on the state's 2004 section 303(d) list for various impairments (Table 1). The impaired designated uses for the nine subsegments are primary and secondary contact recreation and fish and wildlife propagation.

**Table 1. Section 303(d) listing for subsegments in the Terrebonne River Basin**

| Subseg. number | Subseg. name | Impaired use[a] | Causes of impairment | | | | | | Suspected sources of impairment |
|---|---|---|---|---|---|---|---|---|---|
| | | | Chloride | Sulfate | TDS | Sediment | TSS | Turbidity | |
| 120101 | Bayou Portage | PCR, SCR, FWP | X | | X | | X | | Irrigated and nonirrigated crop production (chlor., TDS), source unknown (TSS) |
| 120102 | Bayou Poydras | PCR, FWP | | X | X | X | X | | Source unknown (TSS, Sed.), drainage filling, loss of wetland (Sulfates, TDS) |
| 120104 | Bayou Grosse Tete | PCR, FWP | | | X | | | | Irrigated and nonirrigated crop production |
| 120105 | Chamberlin Canal | PCR, SCR, FWP | | | | X | X | | Source unknown |
| 120106 | Bayou Plaquemine | FWP | | | | | | X | Source unknown |
| 120110 | Bayou Cholpe | FWP | | X | X | | | | Irrigated and nonirrigated crop production, drought related impacts |

| Subseg. number | Subseg. name | Impaired use[a] | Causes of impairment | | | | | | Suspected sources of impairment |
|---|---|---|---|---|---|---|---|---|---|
| | | | Chloride | Sulfate | TDS | Sediment | TSS | Turbidity | |
| 120111 | Bayou Maringouin | PCR, SCR, FWP | | | X | | | | Irrigated and nonirrigated crop production |
| 120112 | Bayou Fordoche | PCR, SCR, FWP | | | X | | | | Irrigated and nonirrigated crop production and drought-related impacts |
| 120201 | Lower Grand River and Belle River | PCR, FWP | | X | | | | | Drought related, petroleum/natural gas activities |

[a]PCR = primary contact recreation; SCR = secondary contact recreation; FWP = fish and wildlife propagation

The numeric water quality criteria that apply to the impaired subsegments and that were used to calculate the TMDLs are presented in Table 2.

**Table 2. Numeric water quality criteria for the listed subsegments**

| Subsegment Number | Subsegment Name | Chloride (mg/L) | Sulfate (mg/L) | TDS (mg/L) | Sediment[a] (mg/L) | TSS[a] (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|
| 120101 | Bayou Portage | 25 | | 200 | | x | |
| 120102 | Bayou Poydras | | 75 | 500 | x | x | |
| 120104 | Bayou Grosse Tete | | | 200 | | | |
| 120105 | Chamberlin Canal | | | | x | x | |
| 120106 | Bayou Plaquemine | | | | | | 150 |
| 120110 | Bayou Cholpe | | 25 | 200 | | | |
| 120111 | Bayou Maringouin | | | 200 | | | |
| 120112 | Bayou Fordoche | | | 200 | | | |
| 120201 | Lower Grand River and Belle River | | 40 | | | | |

[a] No sediment or TSS criteria have been defined in the Louisiana Water Quality Standards. The turbidity criterion of 150 NTU was used as a surrogate for analysis.

Because turbidity cannot be expressed as a mass load, the turbidity TMDL was expressed using TSS as a surrogate. A regression between turbidity and TSS was developed for subsegment 120106 using turbidity and TSS data from that subsegment, resulting in a surrogate TSS endpoint of 125 mg/L.

Because only narrative criteria are available for TSS, it was necessary to calculate a numeric endpoint for TSS to develop the TSS TMDLs. The TSS endpoint was calculated on the basis of the relationship between turbidity and TSS using the same methodology (regression analysis) used to calculate the surrogate TSS value for turbidity in subsegment 120106. The resulting surrogate endpoints were 290 mg/L, 247 mg/L and 302 mg/L for subsegments 120101, 120102 and 120105, respectively.

The TMDLs were calculated using an average concentration reduction approach. The approach calculated a percent reduction for each LDEQ monitoring station by using observed levels of constituents. The minimum percent reduction was calculated so that the monitoring data would meet criteria at that station. The percent reduction was applied to the entire subsegment. If two monitoring stations were present in a subsegment, the larger percent reduction was used to ensure that both monitoring stations meet criteria.

In TMDL development, allowable loadings from all pollutant sources that cumulatively amount to no more than the TMDL must be established and thereby provide the basis for establishing water quality-based controls. WLAs were given to permitted point source discharges. The LAs include background loadings and human-induced nonpoint sources. An explicit MOS of 10 percent and a FG component of 10 percent were included, except for turbidity, sediment and TSS, which had an implicit MOS. Summaries of the TMDLs for each of the subsegments are presented in Tables 3 and 4.

**Table 3. Summary of chloride and sulfate TMDLs, MOS, FG, WLAs and LAs for the Terrebonne River Basin**

| Subsegment | Station | Pollutant | Percent reduction | Total allowable loading | Explicit MOS (10%) | Future growth (10%) | ∑ WLA | ∑ LA |
|---|---|---|---|---|---|---|---|---|
| | | | | kg/day | | | | |
| 120101 | 968 | Chloride | 53.4 | 679.7 | 68.0 | 68.0 | 8.3 | 535.4 |
| 120102 | 969 | Sulfate | 82.5 | 417.9 | 41.8 | 41.8 | 0.0 | 334.3 |
| 120110 | 976 | Sulfate | 84.1 | 136.1 | 13.6 | 13.6 | 0.0 | 108.9 |
| 120201 | 979 | Sulfate | 44.4 | 2,485.9 | 248.6 | 248.6 | 14.2 | 1,974.5 |

**Table 4. Summary of TDS, sediment, TSS and turbidity TMDLs, MOS, FG, WLAs, and LAs for the Terrebonne River Basin**

| Subsegment | Station | Pollutant | Percent reduction | Total allowable loading | Explicit MOS (10%) | Future growth (10%) | ∑ WLA | ∑ LA |
|---|---|---|---|---|---|---|---|---|
| | | | | tons/day | | | | |
| 120101 | 968 | TDS | 66.4 | 6.50 | 0.65 | 0.65 | 0.00 | 5.20 |
| 120102 | 969 | TDS | 43.7 | 4.04 | 0.40 | 0.40 | 0.00 | 3.23 |
| 120104 | 970 | TDS | 32.4 | 10.31 | 1.03 | 1.03 | 0.00 | 8.25 |
| 120110 | 976 | TDS | 55.6 | 2.17 | 0.22 | 0.22 | 0.00 | 1.74 |
| 120111 | 977 | TDS | 63.2 | 3.31 | 0.33 | 0.33 | 0.00 | 2.64 |
| 120112 | 978 | TDS | 43.8 | 3.37 | 0.34 | 0.34 | 0.00 | 2.69 |
| 120101 | 968 | TSS | 62.4 | 2.48 | Implicit | 0.25 | 0.00 | 2.24 |
| 120102 | 969 | Sediment/TSS | 0.0 | 1.21 | Implicit | 0.12 | 0.00 | 1.09 |
| 120105 | 971 | Sediment/TSS | 0.0 | 2.15 | Implicit | 0.22 | 0.00 | 1.94 |
| 120106 | 972 | Turbidity as TSS | 0.0 | 0.07 | Implicit | 0.01 | 0.00 | 0.06 |

## For More Information

EPA seeks input on this proposed TMDL, including comments, information, and data from the general and affected public. For additional information on this TMDL project, please contact the EPA staff listed below:

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